

#### REMARKS

As noted above, this application is a division of Serial No. 09/872,842, filed June 1, 2001 and claims priority from Japanese Application Serial No. 2000-167377, filed June 5, 2000 and Japanese Application Serial No. 2000-330066, filed October 30, 2000.--

New Claims 9 and 24 correspond to original claim 5 and the upper limit of  $B_2O_3$  is amended to less than 15% for distinguishing the claims from JP60-200842 (the '842 patent). New Claims 14 and 29 correspond to original claim 5 and the lower limit of  $Na_2O+K_2O+BaO+ZnO$  is amended to 19.5% in order to distinguish the claims from the '842 patent.

New Claims 19 and 34 of correspond to original claim 5 and the lower limit of BaO is amended to 1% in order to distinguish the claims from the '842 patent.

In making the amendment based on original claim 5, the  $K_2SiF_6$  component, in the compositions of Example Nos. 25-38, 65, 66 and 71-73 of the present application, has been calculated as  $K_2O$ ,  $SiO_2$  and F and the  $KHF_2$  ingredient in the compositions of these examples has been calculated as  $K_2O$  and F. Claims 10, 15, 20, 25, 30 and 34 point out compositions based on the result of the recalculation. Please refer to the attached Table A for the calculations.

In the calculation of values of Table A, since F is an anion ingredient which can be substituted by O, calculation was made so that the total amount of the metal oxides would become 100% and, as to F, amounts of F in the examples were directly used.

The new claims of the present application point out subject matter that is distinguishable from the teachings of the cited references for the following reasons.

Tables 1 and 2 (copy attached) have been prepared to facilitate comparison of the claims of the present application with the cited references. In these Tables, the mark "OK" points out that the amount of an ingredient in an example of the cited references is outside of the claims of the present application and the mark "x" represents that the amounts disclosed in the cited reference are within the amount of the ingredient in the

claims of the present application.

Please refer to Table 1 in order to compare the present invention with the '842 patent.

The glasses of claims 9 and 24 differ from the '842 patent in the amount of  $B_2O_3$  which is equal to 3 to less than 15%.

In the glasses of claims 9 and 24,  $B_2O_3$  is an essential ingredient for forming glass and also is effective for making a low dispersion glass and adjusting viscosity of the glass. If the amount of this ingredient is less than 3%, these effects cannot be achieved sufficiently and, for preventing deterioration of the chemical properties, the amount of this ingredient should preferably be less than 15%.

The glasses of claims 14 and 29 differ from the cited reference in that the amount of  $Na_2O+K_2O+BaO+ZnO$  in the range of 19.5-45%.

In the glasses of claims 14 and 29, the total amount of these ingredients should be within this range for obtaining a glass which is stable, has excellent chemical properties and has excellent transmittance even in the short wavelength region.

The glasses of claims 19 and 34 differ from the cited reference in the amount range of  $BaO = 1-42\%$ .

In the glasses of claims 19 and 34,  $BaO$  is effective for improving refractive index without excessively increasing dispersion of the glass (i.e., without excessively decreasing Abbe number) and providing a stable glass having high resistivity to devitrification over a wide range of glass composition. If the amount of this ingredient exceeds 42%, the chemical properties of the glass are extremely deteriorated.

In the examples of the 842 patent, there is no glass that satisfies even one of the above described compositions concerning  $B_2O_3$ ,  $Na_2O+K_2O+BaO+ZnO$  and  $BaO$ . Moreover, there is no disclosure or suggestion in the '842 patent as to the concept of the present invention for restricting the ranges of the amounts of these ingredients.

Since the glasses of the examples of JP60-77144 (the '144 patent) are mixtures of oxides and fluorides and cannot be compared directly with the glass of new claim 9, we have

calculated the metal fluorides of the cited reference as metal oxides and recalculated the composition so that the total amount of the metal oxides of each example of the cited reference will become 100%. The amount of F is compared by using the values of the respective examples.

Please refer to Table 2 in comparing the present invention with the '144 patent.

The glasses of claims 9 and 24 differ from the cited reference in the amount of  $B_2O_3$  which is equal to 3 to less than 15%. For the reason stated above with respect to the comparison with the '842 patent, the glasses of claims 9 and 24 have this amount  $B_2O_3$ .

In the examples of the '144 patent, there is no glass that satisfies the above described composition concerning  $B_2O_3$  and there is no disclosure or suggestion in the '144 patent as to the concept of the present invention with regard to restricting the range of the amount of this ingredient.

The glasses of claims 14 and 29 differ from the '144 patent in the amount of  $Na_2O+K_2O+BaO+ZnO$  which ranges from 19.5-45%. For the reason stated above with respect to comparison with the '842 patent, the glasses of claims 14 and 29 should have this amount range of  $Na_2O+K_2O+BaO+ZnO$ .

In the examples of the '144 patent, there is no glass that satisfies the above described composition concerning  $Na_2O+K_2O+BaO+ZnO$  and there is no disclosure or suggestion in the cited reference as to the concept of the present invention for restricting the range of the amount of this ingredient.

The glasses of claims 19 and 34 differ from the '144 patent in the amount of  $BaO$  which ranges from 1-42%. For the reasons stated above with respect to comparison with the '842 patent, the glasses of claims 19 and 34 should have this amount of  $BaO$ .

In the examples of the cited reference, there is no glass that satisfies the above described composition concerning  $BaO$  and there is no disclosure or suggestion in the cited reference as to the concept of the present invention for restricting the range of the amount of this ingredient.

The glass of new claims 9, 14, 19, 24, 29 and 34 of the

present application which is a  $\text{SiO}_2\text{-B}_2\text{O}_3$ -alkali metal oxide/alkaline earth metal oxide glass is a glass made of essential ingredients which are entirely different from the glass of the cited reference which is a  $\text{SiO}_2\text{-PbO}$ -alkali metal oxide glass and thus has a glass composition which is very different from the glass of U.S. 4,721,690 (the '690 patent).

Specifically, the glasses of the claims of the present application differ from the glass of the '690 patent in that the glass of the '690 patent requires 30-80% of PbO as an essential ingredient whereas the glasses of the present application may contain PbO as an optional ingredient for preventing solarization but the amount of this ingredient is restricted to a small amount of up to 2%.

The glasses of claims 1, 6, 11, 16, 21 and 26 of the present application differ greatly from U.S. 4,225,459 (the '459 patent) in composition.

Specifically, the glasses of these claims differ from the '459 patent in that the new claims point out a composition of 30-70% of  $\text{SiO}_2$  and 3-20% (3 to less than 15% in claims 9 and 24) of  $\text{B}_2\text{O}_3$  which is not taught or suggested by the '459 patent.

In the examples of the '459 patent, there is no glass that satisfies even one of the above described compositions concerning  $\text{SiO}_2$ , PbO,  $\text{B}_2\text{O}_3$  and F and there is no disclosure or suggestion in the cited reference as to the concept of the present invention for restricting the ranges of the amounts of these ingredients.

For these reasons, none of the cited references discloses or suggests the specific recitations of the new claims of the present application and, therefore, the glasses of the present application are not anticipated by or obvious by any of these cited references singly or in combination.

An early and favorable action is earnestly solicited.

Respectfully submitted,



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